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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| **Office Action Summary** | **Application No.** 10/646,661 | **Applicant(s)** CHEUNG ET AL. | |
|---|---|---|---|
| | **Examiner** IAN N. MOORE | **Art Unit** 2616 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-6,11-13,20-25,30-38,43-51 and 56-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,11-13,20-25,30-38,43-51,56-58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. Claims 12, 13, 32, 44, 45, 57 and 58 are objected to because of the following informalities:

**Claim 12** recites the clause with the optional language "**will be**" in line 3. In order to present the claim in a better form and to describe a positive or require steps/function to be performing (i.e. using the claim language that does not suggest or make optionally but required steps to be performed), applicant is suggested to revise the claim language "**will be**" to "**is**".

**Claims 13, 31, 32, 44, 45, 57 and 58** are also objected for the same reason as set forth above in claim 12.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-6, 11-13, 20-25, 30-38, 43-51, and 56-58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 1** recites the limitation "**said amount**" in last line. There is insufficient antecedent basis for this limitation in the claim.

**Claims 20, 33, 38, 46, and 51** are also rejected for the same reason as set forth above in claim 1.

**Claim 31** recites **"each of the plurality of state probabilities is a probability that a packet will be lost"** in line 2. Claim 32 recites, line 7-8, "the marginal packet loss probability is probability that a packet will be lost"; and claim 30 line 2 recites "each of the plurality of state probability is a probability that a specific number of uses are using a link". Thus, it is unclear whether that "**a probability that packet will be lost**" is "**each of the plurality of state probabilities" or** "the marginal packet loss probability". *(For the purpose of the examination, examiner will assume, in light of the specification,* ***the marginal packet loss probability*** ***is a probability that packet will be lost.)***

**Claims 44 and 57** are also rejected for the same reason as set forth above in claim 31.

**Claims 2-6, 11-13, 21-25, 30,32, 34-37, 43,45,47-50,52-56, and 58** are also objected since they are depended upon rejected claims 1, 20, 33 and 46 as set forth above.

### *Claim Rejections - 35 USC § 101*

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claims 20-25 and 30-32** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter since it fails to be limited to embodiments which fall within a statutory category.

**Claim 20** recites, "a **computer-readable medium** carrying one or more sequences of instructions, which instruction, when executed by one or more processor, cause the one or more processor to carry out the steps of ..." in line 1-2.

**In specification,** page 18, paragraph 64 recites, as follows:

> "the term "**computer-readable medium**" as used herein refers to any medium that participates in providing instructions to processor 404 for execution. **Such a medium may take many forms, including but not limited to**, non-volatile media, volatile media, and **transmission media**. Non-volatile media includes, for example, optical or magnetic disks, such as storage device 410. Volatile media includes dynamic memory, such as main memory 406. Transmission media includes coaxial cables, copper wire and fiber optics, including the wires that comprise bus 402. **Transmission media can also take the form of acoustic or light waves, such as those generated during radio wave and infrared data communications**."

In specification, page 18, paragraph 65 recites as follows:

> "Common forms of **computer-readable media include**, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any **other magnetic medium**, a CD-ROM, any other optical medium, **punchcards, papertape**, **any other physical medium with patterns of holes**, a RAM, a PROM, and EPROM, a FLASH-EPROM, any other memory chip or cartridge, **a carrier wave as described hereinafter**, or any other medium from which a computer can read."

In view of the above, applicant has provided antecedent basis for the claim terminology "computer readable medium". Applicant has provided intrinsic evidence of embodiments (i.e. *"a computer readable medium" is the "a transmission media" which is a signal such as "light waves, radio waves, carrier wave" and a common form such as "puchcards, papertape, or any other physical medium with pattern of holes")* intended to be covered within the meaning.

One of the covered embodiments is a common form printed matter, which in the context of this disclosure covers ***"puchcards, papertape, or any other physical medium with pattern of holes"***. Since it is not until the program is converted into an appropriate electronic form to be read and executed by the processor that it becomes functional descriptive material, this

embodiment is no more than non-functional descriptive material per se, and therefore non-statutory.

Another covered embodiment is a transmission media. Transmission media in the context of this disclosure cover "***light waves, radio waves, carrier wave***", which are not a Manufacture within the meaning of 101, and electrical connections, optical coaxial cables, copper wire and fiber optics fibers, on which the program is still unavailable to the processor. In such embodiments, the program is still unable to act as a computer component and have its functionality realized. Thus, claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Thus, this embodiment is also non-statutory.

In view of the above analysis, claim 20 is ineligible for patent protection as failing to be limited to embodiments which fall within a statutory category.

**Claims 21-25 and 30-32** are also rejected since they are depended upon rejected base claim as set forth above.

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1,12,20,31,33,44,46 and 57 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Soumiya US005583857A) in view of Fodor (US006788646B1), and further in view of Beshai (IEEE journal).

**Regarding Claim 1**, Soumiya discloses a method (see FIG. 1, 18, ATM network system processing the methods/steps, also see FIG. 19-20; see col. 9, line 5-15; see col. 16, line 46-54; see col. 16, line 64-69), the method comprising:

receiving a quality of service (QoS) factor for a link (see FIG. 1, 18, see; obtaining/receiving QoS for a link/line 22; col. 10, line 30-60),

determining (see FIG. 1, determining/calculating by required bandwidth calculator 13), for each of one or more candidate link sizes of said link, based on the QoS factor (see col. 10, line 10-60; see col. 9, line 25-40; calculating potential/candidate link/line bandwidth/size according to QoS; note that capacity/bandwith of a link is called the "size" of the communication link per applicant specification, paragraph 4), wherein said determining is performed based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12);

determining (see FIG. 1, determining/calculating by required bandwidth calculator 13), based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and

traffic class from traffic class judging portion 12), a link size of said link (see FIG. 1, calculated/determined line/link size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60) and

wherein the determining said link size of said link comprises selecting one of the one or more candidate link sizes of said link (see FIG. 1, selecting/determining links/lines size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60); and

storing said amount in memory (see FIG. 1, storing calculated links/lines size/bandwidth in the estimated bandwidth storage portion 15; see col. 9, line 25-30; also see FIG. 18, storing links/lines size/bandwidth in memory 25; see col. 16, line 55-63).

Soumiya does not explicitly disclose "a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities".

However, utilizing a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities is so well known and established in the art as indicated by well-known Erlang Formula and well-known Fluid-Flow analysis (as admitted by the applicant in page 12 of specification), and also evidence by Fodor.

In particular, Fodor teaches receiving a grade of service (GoS) factor (see col. 3, line 10-15; see col. 10, line 1-7; receiving/obtaining grade of service (GOS) factor/ parameter), wherein the GoS factor specifies a maximum call blocking probability for said link (see col. 3, line 25-33; see col. 10, line 8-38; GOS predetermines/specifies call blocking probability, $B^{max}$, for the link/line) and determining, for each of one or more candidate link sizes of said link (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; selecting/determining

potential/candidate link/line bandwidth/size), a plurality of state probabilities based on the GoS factor (see col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; system/steady state probability according to Erlang Formula while meeting/satisfying GOS call blocking requirement);

determining comprises selection one of the one or more candidate link sizes of said link, using the probability of state probabilities (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; selecting/determining potential/candidate link/line bandwidth/size according to system/steady state probability).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide, "a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities", as taught by Fodor in the system of Soumiya, so that it would enable/ensure that the call GOS level is guaranteed for traffic on the link; see Fodor col. 3, line 10-16; so that it would benefit to develop and utilize a link capacity/bandwidth for optimization; see Fodor col. 2, line 48-50.

Neither Soumiya nor Fodor explicitly discloses "QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities".

However, utilizing QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining

comprises selecting one of the one or more using the plurality of marginal packet loss probabilities so well known in art as evident by Beshai.

In particular, Beshai discloses QoS factor specifies a maximum packet loss probability for said link (see section II, section III B-C, IV, V, Appendix. II, QoS specifics/identifies the overall/aggregate/maximum cell loss probability), and the plurality of marginal packet loss probabilities based on QoS factor (see section II; section III B-C, IV, V, Appendix. II, marginal/original probability of packet lost is determined based on QoS), and the determining comprises selecting one of the one or more candidate link sizes of said link using the plurality of state probabilities (see section III C, V, Appendix I, II, determining/selecting capacity/load/size of the link/line/connection using state probabilities according to Erlang Formula) and the plurality of marginal packet loss probabilities (see section II, section III B-C, IV, V, Appendix. II; see section II; section III B-C, IV, V, Appendix. II, and marginal/original probability of packet lost).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities" as taught by Beshai, in the combined system of Soumiya and Fodor, so that it would provide low cost and high performance as suggested by Beshai; see Beshai section I.

**Regarding Claim 12**, the combined system of Soumiya, Fodor, Beshai discloses each of the plurality of marginal packet loss probabilities is a probability as set forth above in claim 1. Soumiya discloses when packet is send through said link (see FIG. 18, 27, a cell is send through

link/line; see col. 16, line 46-64; see col. 1, line 50-66) that has a specified amount of bandwidth (see FIG. 2, a link/line has a bandwidth; see col. 3667) and is being used by a specified number of users (see FIG. 18, 27, and utilize by a number of users/subscribers, where each user/subscriber (see FIG. 18), using the link/line, is associated with each call; see col. 7, line 11-16; see col. 7, line 50-60; see col. 9, line 21-40; see col. 10, line 31-40).

Neither Soumiya nor Fodor explicitly disclose "that a packet will be lost".

However, determining bandwidth based upon a probability of packet lost is so well known in the art. In particular, Beshai discloses each of the plurality of marginal packet loss probability is a probability that a packet will be lost when said packet is send through a link that: has a specific amount of bandwidth; (see section II, section III B-C, IV, V, Appendix. II; marginal/original probability is a probability of cell lost probability for a cell that will be lost when traverses over the link that has a predefined/specific recourses/capacity capacity/bandwidth, and used by users of the network).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "that a packet will be lost" as taught by Beshai, in the combined system of Soumiya and Fodor, so that it would provide low cost and high performance as suggested by Beshai; see Beshai section I.

**Regarding Claim 20**, Soumiya discloses a computer-readable storage medium carrying one or more sequences of instructions (see FIG. 18, memory 25; see col. 9, line 5-15; see col. 16, line 46-54), which instructions, when executed by one or more processors (see FIG. 18, processed/executed by a combined controlling system of controller 23 and admission controller 24), cause the one or more processors to carry out the steps of (see FIG. 1, 18, causing the

combined controlling system to process the methods/steps for ATM network system, also see FIG. 19-20; see col. 9, line 5-15; see col. 16, line 64-69):

receiving a quality of service (QoS) factor for a link (see FIG. 1, 18, see; obtaining/receiving QoS for a link/line 22; col. 10, line 30-60),

determining (see FIG. 1, determining/calculating by required bandwidth calculator 13), for each of one or more candidate link sizes of said link, based on the QoS factor (see col. 10, line 10-60; see col. 9, line 25-40; calculating potential/candidate link/line bandwidth/size according to QoS; note that capacity/bandwith of a link is called the "size" of the communication link per applicant specification, paragraph 4), wherein said determining is performed based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12);

determining (see FIG. 1, determining/calculating by required bandwidth calculator 13), based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12), a link size of said link (see FIG. 1, calculated/determined line/link size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60) and

wherein the determining said link size of said link comprises selecting one of the one or more candidate link sizes of said link (see FIG. 1, selecting/determining links/lines size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60); and

storing said amount in memory (see FIG. 1, storing calculated bandwidth in the estimated bandwidth storage portion 15; see col. 9, line 25-30; also see FIG. 18, storing bandwidth in memory 25; see col. 16, line 55-63).

Soumiya does not explicitly disclose "a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities".

However, utilizing a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities is so well known and established in the art as indicated by well-known Erlang Formula and well-known Fluid-Flow analysis (as admitted by the applicant in page 12 of specification), and also evidence by Fodor.

In particular, Fodor teaches receiving a grade of service (GoS) factor (see col. 3, line 10-15; see col. 10, line 1-7; receiving/obtaining grade of service (GOS) factor/ parameter), wherein the GoS factor specifies a maximum call blocking probability for said link (see col. 3, line 25-33; see col. 10, line 8-38; GOS predetermines/specifies call blocking probability, $B^{max}$, for the link/line) and determining, for each of one or more candidate link sizes of said link (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; selecting/determining potential/candidate link/line bandwidth/size), a plurality of state probabilities based on the GoS factor (see col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; system/steady state probability according to Erlang Formula while meeting/satisfying GOS call blocking requirement);

determining comprises selection one of the one or more candidate link sizes of said link, using the probability of state probabilities (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; selecting/determining potential/candidate link/line bandwidth/size according to system/steady state probability).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide, "a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities", as taught by Fodor in the system of Soumiya, so that it would enable/ensure that the call GOS level is guaranteed for traffic on the link; see Fodor col. 3, line 10-16; so that it would benefit to develop and utilize a link capacity/bandwidth for optimization; see Fodor col. 2, line 48-50.

Neither Soumiya nor Fodor explicitly discloses "QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities".

However, utilizing QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities so well known in art as evident by Beshai.

In particular, Beshai discloses QoS factor specifies a maximum packet loss probability for said link (see section II, section III B-C, IV, V, Appendix. II, QoS specifics/identifies the overall/aggregate/maximum cell loss probability), and the plurality of marginal packet loss

probabilities based on QoS factor (see section II; section III B-C, IV, V, Appendix. II, marginal/original probability of packet lost is determined based on QoS), and the determining comprises selecting one of the one or more candidate link sizes of said link using the plurality of state probabilities (see section III C, V, Appendix I, II, determining/selecting capacity/load/size of the link/line/connection using state probabilities according to Erlang Formula) and the plurality of marginal packet loss probabilities (see section II, section III B-C, IV, V, Appendix. II; see section II; section III B-C, IV, V, Appendix. II, and marginal/original probability of packet lost).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities" as taught by Beshai, in the combined system of Soumiya and Fodor, so that it would provide low cost and high performance as suggested by Beshai; see Beshai section I.

**Regarding Claim 31,** the combined system of Soumiya, Fodor, Beshai discloses each of the plurality of marginal packet loss probabilities is a probability as set forth above in claim 20. Soumiya discloses when packet is send through said link (see FIG. 18, 27, a cell is send through link/line; see col. 16, line 46-64; see col. 1, line 50-66) that has a specified amount of bandwidth (see FIG. 2, a link/line has a bandwidth; see col. 3667) and is being used by a specified number of users (see FIG. 18, 27, and utilize by a number of users/subscribers, where each user/subscriber (see FIG. 18), using the link/line, is associated with each call; see col. 7, line 11-16; see col. 7, line 50-60; see col. 9, line 21-40; see col. 10, line 31-40).

Neither Soumiya nor Fodor explicitly disclose "that a packet will be lost".

However, determining bandwidth based upon a probability of packet lost is so well known in the art. In particular, Beshai discloses each of the plurality of marginal packet loss probability is a probability that a packet will be lost when said packet is send through a link that: has a specific amount of bandwidth; (see section II, section III B-C, IV, V, Appendix. II; marginal/original probability is a probability of cell lost probability for a cell that will be lost when traverses over the link that has a predefined/specific recourses/capacity capacity/bandwidth, and used by users of the network).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "that a packet will be lost" as taught by Beshai, in the combined system of Soumiya and Fodor, so that it would provide low cost and high performance as suggested by Beshai; see Beshai section I.

**Regarding Claim 33**, Soumiya discloses an apparatus (see FIG. 1, 18, ATM network system processing, see col. 9, line 5-15; see col. 16, line 46-54; see col. 16, line 64-69), comprising:

means for receiving (see FIG. 1, receiving/input side/means) a quality of service (QoS) factor for a link (see FIG. 1, 18, see; obtaining/receiving QoS for a link/line 22; col. 10, line 30-60),

means for determining (see FIG. 1, required bandwidth calculator 13 calculates/determines), for each of one or more candidate link sizes of said link, based on the QoS factor (see col. 10, line 10-60; see col. 9, line 25-40; calculating potential/candidate link/line bandwidth/size according to QoS; note that capacity/bandwith of a link is called the "size" of the

communication link per applicant specification, paragraph 4), wherein said determining is performed based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12);

means for determining (see FIG. 1, required bandwidth calculator 13 calculates/determines), based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12), a link size of said link (see FIG. 1, calculated/determined line/link size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60) and

wherein the determining comprises selecting one of the one or more candidate link sizes of said link (see FIG. 1, selecting/determining links/lines size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60); and

storing said amount in memory (see FIG. 1, storing calculated link/line bandwidth/size in the estimated bandwidth storage portion 15; see col. 9, line 25-30; also see FIG. 18, storing bandwidth/size in memory 25; see col. 16, line 55-63).

Soumiya does not explicitly disclose "a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities".

However, utilizing a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the

GoS factor, and using the plurality of state probabilities is so well known and established in the art as indicated by well-known Erlang Formula and well-known Fluid-Flow analysis (as admitted by the applicant in page 12 of specification), and also evidence by Fodor.

In particular, Fodor teaches receiving a grade of service (GoS) factor (see col. 3, line 10-15; see col. 10, line 1-7; receiving/obtaining grade of service (GOS) factor/ parameter), wherein the GoS factor specifies a maximum call blocking probability for said link (see col. 3, line 25-33; see col. 10, line 8-38; GOS predetermines/specifies call blocking probability, $B^{max}$, for the link/line) and determining, for each of one or more candidate link sizes of said link (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; selecting/determining potential/candidate link/line bandwidth/size), a plurality of state probabilities based on the GoS factor (see col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; system/steady state probability according to Erlang Formula while meeting/satisfying GOS call blocking requirement);

determining comprises selection one of the one or more candidate link sizes of said link, using the probability of state probabilities (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; selecting/determining potential/candidate link/line bandwidth/size according to system/steady state probability).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide, “a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities”, as taught by Fodor in the system of Soumiya, so that it would enable/ensure that the call GOS level is guaranteed for

traffic on the link; see Fodor col. 3, line 10-16; so that it would benefit to develop and utilize a link capacity/bandwidth for optimization; see Fodor col. 2, line 48-50.

Neither Soumiya nor Fodor explicitly discloses "QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities".

However, utilizing QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities so well known in art as evident by Beshai.

In particular, Beshai discloses QoS factor specifies a maximum packet loss probability for said link (see section II, section III B-C, IV, V, Appendix. II, QoS specifics/identifies the overall/aggregate/maximum cell loss probability), and the plurality of marginal packet loss probabilities based on QoS factor (see section II; section III B-C, IV, V, Appendix. II, marginal/original probability of packet lost is determined based on QoS), and the determining comprises selecting one of the one or more candidate link sizes of said link using the plurality of state probabilities (see section III C, V, Appendix I, II, determining/selecting capacity/load/size of the link/line/connection using state probabilities according to Erlang Formula) and the plurality of marginal packet loss probabilities (see section II, section III B-C, IV, V, Appendix. II; see section II; section III B-C, IV, V, Appendix. II, and marginal/original probability of packet lost).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities" as taught by Beshai, in the combined system of Soumiya and Fodor, so that it would provide low cost and high performance as suggested by Beshai; see Beshai section I.

**Regarding Claim 44,** the combined system of Soumiya, Fodor, Beshai discloses each of the plurality of marginal packet loss probabilities is a probability as set forth above in claim 33. Soumiya discloses when packet is send through said link (see FIG. 18, 27, a cell is send through link/line; see col. 16, line 46-64; see col. 1, line 50-66) that has a specified amount of bandwidth (see FIG. 2, a link/line has a bandwidth; see col. 3667) and is being used by a specified number of users (see FIG. 18, 27, and utilize by a number of users/subscribers, where each user/subscriber (see FIG. 18), using the link/line, is associated with each call; see col. 7, line 11-16; see col. 7, line 50-60; see col. 9, line 21-40; see col. 10, line 31-40).

Neither Soumiya nor Fodor explicitly disclose "that a packet will be lost".

However, determining bandwidth based upon a probability of packet lost is so well known in the art. In particular, Beshai discloses each of the plurality of marginal packet loss probability is a probability that a packet will be lost when said packet is send through a link that: has a specific amount of bandwidth; (see section II, section III B-C, IV, V, Appendix. II; marginal/original probability is a probability of cell lost probability for a cell that will be lost when traverses over the link that has a predefined/specific recourses/capacity capacity/bandwidth, and used by users of the network).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "that a packet will be lost" as taught by Beshai, in the combined system of Soumiya and Fodor, so that it would provide low cost and high performance as suggested by Beshai; see Beshai section I.

**Regarding Claim 46**, Soumiya discloses an apparatus (see FIG. 1, 18, 27, ATM network system 3C-n, see col. 9, line 5-15; see col. 16, line 46-54; see col. 16, line 64-69), comprising:

a network interface (see FIG. 18, Line Interface 22n; see FIG. 27) that is coupled to a data network (see FIG. 27, connecting/coupling to ATM network 3) for receiving one or more packet flows therefrom (see col. 1, line 50 to col. 2, line 60; see col. 16, line 46-65; to receiving flows of cells);

a processor (see FIG. 18, a combined controlling system of controller 23 and admission controller 24); and one or more stored sequences of instructions (see FIG. 18, memory 25 stores the sequence of instructions/programs) which, when executed by the processor (see FIG. 18, processed/executed by a combined controlling system of controller 23 and admission controller 24), cause the processor to carry out the steps of (see FIG. 1, 18, causing the combined controlling system to process the methods/steps for ATM network system, also see FIG. 19-20; see col. 9, line 5-15; see col. 16, line 64-69):

receiving a quality of service (QoS) factor (see col. 10, line 30-60; obtaining/receiving QoS),

determining (see FIG. 1, determining/calculating by required bandwidth calculator 13), for each of one or more candidate link sizes of said link, based on the QoS factor (see col. 10, line 10-60; see col. 9, line 25-40; calculating potential/candidate link/line bandwidth/size

according to QoS; note that capacity/bandwith of a link is called the "size" of the communication link per applicant specification, paragraph 4), wherein said determining is performed based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12);

determining (see FIG. 1, determining/calculating by required bandwidth calculator 13), based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12), a link size of said link (see FIG. 1, calculated/determined line/link size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60) and

storing said amount in memory (see FIG. 1, storing calculated links/lines size/bandwidth in the estimated bandwidth storage portion 15; see col. 9, line 25-30; also see FIG. 18, storing links/lines size/bandwidth in memory 25; see col. 16, line 55-63).

Soumiya does not explicitly disclose "a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities".

However, utilizing a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities is so well known and established in the

art as indicated by well-known Erlang Formula and well-known Fluid-Flow analysis (as admitted by the applicant in page 12 of specification), and also evidence by Fodor.

In particular, Fodor teaches receiving a grade of service (GoS) factor (see col. 3, line 10-15; see col. 10, line 1-7; receiving/obtaining grade of service (GOS) factor/ parameter), wherein the GoS factor specifies a maximum call blocking probability for said link (see col. 3, line 25-33; see col. 10, line 8-38; GOS predetermines/specifies call blocking probability, $B^{max}$, for the link/line) and determining, for each of one or more candidate link sizes of said link (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; selecting/determining potential/candidate link/line bandwidth/size), a plurality of state probabilities based on the GoS factor (see col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; system/steady state probability according to Erlang Formula while meeting/satisfying GOS call blocking requirement);

determining comprises selection one of the one or more candidate link sizes of said link, using the probability of state probabilities (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; selecting/determining potential/candidate link/line bandwidth/size according to system/steady state probability).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide, "a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities", as taught by Fodor in the system of Soumiya, so that it would enable/ensure that the call GOS level is guaranteed for

traffic on the link; see Fodor col. 3, line 10-16; so that it would benefit to develop and utilize a link capacity/bandwidth for optimization; see Fodor col. 2, line 48-50.

Neither Soumiya nor Fodor explicitly discloses "QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities".

However, utilizing QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities so well known in art as evident by Beshai.

In particular, Beshai discloses QoS factor specifies a maximum packet loss probability for said link (see section II, section III B-C, IV, V, Appendix. II, QoS specifics/identifies the overall/aggregate/maximum cell loss probability), and the plurality of marginal packet loss probabilities based on QoS factor (see section II; section III B-C, IV, V, Appendix. II, marginal/original probability of packet lost is determined based on QoS), and the determining comprises selecting one of the one or more candidate link sizes of said link using the plurality of state probabilities (see section III C, V, Appendix I, II, determining/selecting capacity/load/size of the link/line/connection using state probabilities according to Erlang Formula) and the plurality of marginal packet loss probabilities (see section II, section III B-C, IV, V, Appendix. II; see section II; section III B-C, IV, V, Appendix. II, and marginal/original probability of packet lost).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities" as taught by Beshai, in the combined system of Soumiya and Fodor, so that it would provide low cost and high performance as suggested by Beshai; see Beshai section I.

**Regarding Claim 57,** the combined system of Soumiya, Fodor, Beshai discloses each of the plurality of marginal packet loss probabilities is a probability as set forth above in claim 46. Soumiya discloses when packet is send through said link (see FIG. 18, 27, a cell is send through link/line; see col. 16, line 46-64; see col. 1, line 50-66) that has a specified amount of bandwidth (see FIG. 2, a link/line has a bandwidth; see col. 3667) and is being used by a specified number of users (see FIG. 18, 27, and utilize by a number of users/subscribers, where each user/subscriber (see FIG. 18), using the link/line, is associated with each call; see col. 7, line 11-16; see col. 7, line 50-60; see col. 9, line 21-40; see col. 10, line 31-40).

Neither Soumiya nor Fodor explicitly disclose "that a packet will be lost".

However, determining bandwidth based upon a probability of packet lost is so well known in the art. In particular, Beshai discloses each of the plurality of marginal packet loss probability is a probability that a packet will be lost when said packet is send through a link that: has a specific amount of bandwidth; (see section II, section III B-C, IV, V, Appendix. II; marginal/original probability is a probability of cell lost probability for a cell that will be lost when traverses over the link that has a predefined/specific recourses/capacity capacity/bandwidth, and used by users of the network).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "that a packet will be lost" as taught by Beshai, in the combined system of Soumiya and Fodor, so that it would provide low cost and high performance as suggested by Beshai; see Beshai section I.

8. Claims 2, 21, 34 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soumiya in view of Fodor and Beshai, and further in view of Kraushaar (US 4,200,771).

**Regarding Claim 2**, Soumiya discloses calls made by one or more users using said link (see FIG. 18, calls/connection requests are made by users/subscribers using line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average time between arrivals of calls".

However, measuring/determining an average time between arrivals of calls, which is well known in the art as interarrival time, which is used to computes Erlang (i.e. call hours). In particular, Kraushaar teaches an average time between arrivals of calls made by one or more users using said link (see col. 1, line 60-45; see col. 2, line 60-67; average time between call arrivals is called interval arrival, note that each call is associated with a user/subscriber using a line/link/connection to computes Erlang for congestion control).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average time between arrivals of calls or interarrival time, as taught by Kraushaar in the combined system of Soumiya, Fodor and Beshai, so that it would provide accurate measuring/determining of congestion and non-congestion periods; see

Kraushaar abstract; see col. 2, line 1-41; also by measuring/determining interarrival time, it enables to computes Erlang to determine link/lines/trunk utilizations.

**Regarding Claim 21,** Soumiya discloses calls made by one or more users using said link (see FIG. 18, calls/connection requests are made by users/subscribers using line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average time between arrivals of calls".

However, measuring/determining an average time between arrivals of calls, which is well known in the art as interarrival time, which is used to computes Erlang (i.e. call hours). In particular, Kraushaar teaches an average time between arrivals of calls made by one or more users using said link (see col. 1, line 60-45; see col. 2, line 60-67; average time between call arrivals is called interval arrival, note that each call is associated with a user/subscriber using a line/link/connection to computes Erlang for congestion control).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average time between arrivals of calls or interarrival time, as taught by Kraushaar in the combined system of Soumiya, Fodor and Beshai, so that it would provide accurate measuring/determining of congestion and non-congestion periods; see Kraushaar abstract; see col. 2, line 1-41; also by measuring/determining interarrival time, it enables to computes Erlang to determine link/lines/trunk utilizations.

**Regarding Claim 34**, Soumiya discloses calls made by one or more users using said link (see FIG. 18, calls/connection requests are made by users/subscribers using line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average time between arrivals of calls".

However, measuring/determining an average time between arrivals of calls, which is well known in the art as interarrival time, which is used to computes Erlang (i.e. call hours). In particular, Kraushaar teaches an average time between arrivals of calls made by one or more users using said link (see col. 1, line 60-45; see col. 2, line 60-67; average time between call arrivals is called interval arrival, note that each call is associated with a user/subscriber using a line/link/connection to computes Erlang for congestion control).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average time between arrivals of calls or interarrival time, as taught by Kraushaar in the combined system of Soumiya, Fodor and Beshai, so that it would provide accurate measuring/determining of congestion and non-congestion periods; see Kraushaar abstract; see col. 2, line 1-41; also by measuring/determining interarrival time, it enables to computes Erlang to determine link/lines/trunk utilizations.

**Regarding Claim 47**, Soumiya discloses calls made by one or more users using said link (see FIG. 18, calls/connection requests are made by users/subscribers using line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average time between arrivals of calls".

However, measuring/determining an average time between arrivals of calls, which is well known in the art as interarrival time, which is used to computes Erlang (i.e. call hours). In particular, Kraushaar teaches an average time between arrivals of calls made by one or more

users using said link (see col. 1, line 60-45; see col. 2, line 60-67; average time between call arrivals is called interval arrival, note that each call is associated with a user/subscriber using a line/link/connection to computes Erlang for congestion control).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average time between arrivals of calls or interarrival time, as taught by Kraushaar in the combined system of Soumiya, Fodor and Beshai so that it would provide accurate measuring/determining of congestion and non-congestion periods; see Kraushaar abstract; see col. 2, line 1-41; also by measuring/determining interarrival time, it enables to computes Erlang to determine link/lines/trunk utilizations.

9. Claims 3, 22, 35 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soumiya in view of Fodor and Beshai, and further in view of Mashinksy (US 20050111647A1).

**Regarding Claim 3**, Soumiya discloses calls made by one or more users using said link (see FIG. 18, calls/connection requests are made by users/subscribers using line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average duration of calls".

However, Mashinksy teaches determining an average duration of calls made by one or more users using said link (see FIG. 1, determining an average call length/duration made by customers at calling locations 12 and 14 using the a link/line; see page 6, paragraph 65; see page 2, paragraph 27).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average duration of calls, as taught by Mashinksy in the

combined system of Soumiya, Fodor and Beshai so that it would enable to determine least/better cost route/link and to determine better quality route/link for transmission; see Mashinksy see page 2, paragraph 12-13; see page 6, paragraph 65.

**Regarding Claim 22**, Soumiya discloses calls made by one or more users using said link (see FIG. 18, calls/connection requests are made by users/subscribers using line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average duration of calls".

However, Mashinksy teaches determining an average duration of calls made by one or more users using said link (see FIG. 1, determining an average call length/duration made by customers at calling locations 12 and 14 using the a link/line; see page 6, paragraph 65; see page 2, paragraph 27).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average duration of calls, as taught by Mashinksy in the combined system of Soumiya, Fodor and Beshai, so that it would enable to determine least/better cost route/link and to determine better quality route/link for transmission; see Mashinksy see page 2, paragraph 12-13; see page 6, paragraph 65.

**Regarding Claim 35**, Soumiya discloses calls made by one or more users using said link (see FIG. 18, calls/connection requests are made by users/subscribers using line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average duration of calls".

However, Mashinksy teaches determining an average duration of calls made by one or more users using said link (see FIG. 1, determining an average call length/duration made by

customers at calling locations 12 and 14 using the a link/line; see page 6, paragraph 65; see page 2, paragraph 27).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average duration of calls, as taught by Mashinksy in the combined system of Soumiya, Fodor and Beshai so that it would enable to determine least/better cost route/link and to determine better quality route/link for transmission; see Mashinksy see page 2, paragraph 12-13; see page 6, paragraph 65.

**Regarding Claim 48**, Soumiya discloses calls made by one or more users using said link (see FIG. 18, calls/connection requests are made by users/subscribers using line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose “an average duration of calls”.

However, Mashinksy teaches determining an average duration of calls made by one or more users using said link (see FIG. 1, determining an average call length/duration made by customers at calling locations 12 and 14 using the a link/line; see page 6, paragraph 65; see page 2, paragraph 27).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average duration of calls, as taught by Mashinksy in the combined system of Soumiya, Fodor and Beshai so that it would enable to determine least/better cost route/link and to determine better quality route/link for transmission; see Mashinksy see page 2, paragraph 12-13; see page 6, paragraph 65.

10. Claims 4, 23, 36 and 49 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Soumiya in view of Fodor and Beshai, and further in view of VanDervort (US 5,699,346).

**Regarding Claim 4**, Soumiya discloses arrivals of packets on said link (see FIG. 18, cells are arriving on the line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose “an average time between arrivals of packets”.

However, VanDervort teaches determining an average time between arrivals of packets on said link (see col. 13, line 35-45; see col. 14, line 50-65; see col. 17, line 15-21; measuring by averaging intercell arrival time between arrival of cells during a connection/link).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average time between arrivals of packets, as taught by VanDervort in the combined system of Soumiya, Fodor and Beshai so that it would measure and ensure the conformity to service agreement; see VanDervort col. 5, line 25-45.

**Regarding Claim 23**, Soumiya discloses arrivals of packets on said link (see FIG. 18, cells are arriving on the line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose “an average time between arrivals of packets”.

However, VanDervort teaches determining an average time between arrivals of packets on said link (see col. 13, line 35-45; see col. 14, line 50-65; see col. 17, line 15-21; measuring by averaging intercell arrival time between arrival of cells during a connection/link).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average time between arrivals of packets, as taught by

VanDervort in the combined system of Soumiya, Fodor and Beshai so that it would measure and ensure the conformity to service agreement; see VanDervort col. 5, line 25-45.

**Regarding Claim 36**, Soumiya discloses arrivals of packets on said link (see FIG. 18, cells are arriving on the line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average time between arrivals of packets".

However, VanDervort teaches determining an average time between arrivals of packets on said link (see col. 13, line 35-45; see col. 14, line 50-65; see col. 17, line 15-21; measuring by averaging intercell arrival time between arrival of cells during a connection/link).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average time between arrivals of packets, as taught by VanDervort in the combined system of Soumiya, Fodor and Beshai so that it would measure and ensure the conformity to service agreement; see VanDervort col. 5, line 25-45.

**Regarding Claim 49**, Soumiya discloses arrivals of packets on said link (see FIG. 18, cells are arriving on the line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average time between arrivals of packets".

However, VanDervort teaches determining an average time between arrivals of packets on said link (see col. 13, line 35-45; see col. 14, line 50-65; see col. 17, line 15-21; measuring by averaging intercell arrival time between arrival of cells during a connection/link).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average time between arrivals of packets, as taught by

VanDervort in the combined system of Soumiya, Fodor and Beshai so that it would measure and ensure the conformity to service agreement; see VanDervort col. 5, line 25-45.

11. Claims 5, 24, 37 and 50 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Soumiya in view of Fodor, Beshai and further in view of Depelteau (US006118764A).

**Regarding Claim 5**, Soumiya discloses packets are transmitted relatively continuously on said link (see FIG. 18, cells are transmitted continuously on the line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average duration period during which packets are transmitted".

However, Depelteau teaches determining an average duration period which packets are transmitted relatively continuously on said link (see col. 5, line 54-60; see col. 6, line 39-67; see col. 7, line 30-34; determining average cell interdeparture time which cells are transmitted continuously over a connection/link).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average duration period during which packets are transmitted, as taught by Depelteau in the combined system of Soumiya, Fodor and Beshai so that it would provide controlling the flow of ATM cells; see Depelteau col. 2, line 5-15.

**Regarding Claim 24**, Soumiya discloses packets are transmitted relatively continuously on said link (see FIG. 18, cells are transmitted continuously on the line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average duration period during which packets are transmitted".

However, Depelteau teaches determining an average duration period which packets are transmitted relatively continuously on said link (see col. 5, line 54-60; see col. 6, line 39-67; see col. 7, line 30-34; determining average cell interdeparture time which cells are transmitted continuously over a connection/link).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average duration period during which packets are transmitted, as taught by Depelteau in the combined system of Soumiya, Fodor and Beshai so that it would provide controlling the flow of ATM cells; see Depelteau col. 2, line 5-15.

**Regarding Claim 37**, Soumiya discloses packets are transmitted relatively continuously on said link (see FIG. 18, cells are transmitted continuously on the line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average duration period during which packets are transmitted".

However, Depelteau teaches determining an average duration period which packets are transmitted relatively continuously on said link (see col. 5, line 54-60; see col. 6, line 39-67; see col. 7, line 30-34; determining average cell interdeparture time which cells are transmitted continuously over a connection/link).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average duration period during which packets are

transmitted, as taught by Depelteau in the combined system of Soumiya, Fodor and Beshai so that it would provide controlling the flow of ATM cells; see Depelteau col. 2, line 5-15.

**Regarding Claim 50**, Soumiya discloses packets are transmitted relatively continuously on said link (see FIG. 18, cells are transmitted continuously on the line 22n; see col. 16, line 46-64).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "an average duration period during which packets are transmitted".

However, Depelteau teaches determining an average duration period which packets are transmitted relatively continuously on said link (see col. 5, line 54-60; see col. 6, line 39-67; see col. 7, line 30-34; determining average cell interdeparture time which cells are transmitted continuously over a connection/link).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an average duration period during which packets are transmitted, as taught by Depelteau in the combined system of Soumiya, Fodor and Beshai so that it would provide controlling the flow of ATM cells; see Depelteau col. 2, line 5-15.

12. Claims 6, 25, 38 and 51 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Soumiya in view of Fodor and Beshai, and further in view of Takeuchi (US 20040062256A1).

**Regarding Claim 6**, Soumiya discloses determining link size as set forth above in claim 1.

Neither Soumiya, Fodor, nor Beshai explicitly disclose "based on a specific number of users".

However, Takeuchi teaches determining said link size is based on a specified number of users (see page 2, paragraph 32-33; see page 3, paragraph 48; see page 4, paragraph 50; allocating link/line bandwidth/size according to the number of users).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide allocation link size "base on a specific number of users", as taught by Takeuchi in the combined system of Soumiya, Fodor and Beshai so that it would provide bandwidth control on user basis; see Takeuchi col. 2, line 5-15.

**Regarding Claim 25**, Soumiya discloses determining link size as set forth above in claim 20.

Neither Soumiya, Fodor, nor Beshai explicitly disclose "based on a specific number of users".

However, Takeuchi teaches determining bandwidth amount is based on a specified number of users (see page 2, paragraph 32-33; see page 3, paragraph 48; see page 4, paragraph 50; allocating link/line bandwidth/size according to the number of users).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide allocation link/line bandwidth/size base on a specific number of users, as taught by Takeuchi in the combined system of Soumiya, Fodor and Beshai so that it would provide bandwidth control on user basis; see Takeuchi col. 2, line 5-15.

**Regarding Claim 38**, Soumiya discloses determining link size (or) bandwith as set forth above in claim 33.

Neither Soumiya, Fodor, nor Beshai explicitly disclose "based on a specific number of users".

However, Takeuchi teaches determining link size (or) bandwith is based on a specified number of users (see page 2, paragraph 32-33; see page 3, paragraph 48; see page 4, paragraph 50; allocating link/line bandwidth/size according to the number of users).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide allocation link/line bandwidth/size base on a specific number of users, as taught by Takeuchi in the combined system of Soumiya, Fodor and Beshai so that it would provide bandwidth control on user basis; see Takeuchi col. 2, line 5-15.

**Regarding Claim 51**, Soumiya discloses determining link size (or) bandwith as set forth above in claim 46.

Neither Soumiya, Fodor, nor Beshai explicitly disclose "based on a specific number of users".

However, Takeuchi teaches determining link size (or) bandwith is based on a specified number of users (see page 2, paragraph 32-33; see page 3, paragraph 48; see page 4, paragraph 50; allocating link/line bandwidth/size according to the number of users).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide allocation link/line bandwidth/size base on a specific number of users, as taught by Takeuchi in the combined system of Soumiya, Fodor and Beshai so that it would provide bandwidth control on user basis; see Takeuchi col. 2, line 5-15.

13. Claims 11, 30, 43 and 56 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Soumiya in view of Fodor and Beshai, and further in view of Ishikawa (US005838671A).

**Regarding Claim 11**, the combined system of Soumiya, Fodor and Beshai discloses each of the plurality of state probability is a probability as set forth above in claim 1. Fodor discloses a probability when a specified maximum call blocking required is satisfied relative to said link(see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; the system/steady state probability per to Erlang Formula when meeting/satisfying GOS call blocking requirement to the link/line/connection).

Neither Soumiya, Fodor, nor Beshai explicitly disclose "a specified number of users are using said link".

However, Ishikawa teaches each of the plurality of state probability is a probability that a specified number of users are using said link when a specified maximum call blocking required is satisfied relative to said link (see FIG. 6, state probability is a probability of number connectable users within quality when maintaining/satisfying maximum blocking probability 1%; see col. 9, line 5-20; see col. 12, line 10-50; see col. 16, line 63 to col. 17, line 11).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "a specified number of users are using said link", as taught by Ishikawa in the combined system of Soumiya, Fodor and Beshai so that it would provide call admission control flexibly deal with a traffic variation and stratify a given blocking probability while guaranteeing the quality; see Ishikawa col. 2, line 45-56.

**Regarding Claim 30**, the combined system of Soumiya, Fodor and Beshai discloses each of the plurality of state probability is a probability as set forth above in claim 1. Fodor discloses a

probability when a specified maximum call blocking required is satisfied relative to said link(see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; the system/steady state probability per to Erlang Formula when meeting/satisfying GOS call blocking requirement to the link/line/connection).

Neither Soumiya, Fodor, nor Beshai explicitly disclose “a specified number of users are using said link”.

However, Ishikawa teaches each of the plurality of state probability is a probability that a specified number of users are using said link when a specified maximum call blocking required is satisfied relative to said link (see FIG. 6, state probability is a probability of number connectable users within quality when maintaining/satisfying maximum blocking probability 1%; see col. 9, line 5-20; see col. 12, line 10-50; see col. 16, line 63 to col. 17, line 11).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide “a specified number of users are using said link”, as taught by Ishikawa in the combined system of Soumiya, Fodor and Beshai so that it would provide call admission control flexibly deal with a traffic variation and stratify a given blocking probability while guaranteeing the quality; see Ishikawa col. 2, line 45-56.

**Regarding Claim 43**, the combined system of Soumiya, Fodor and Beshai discloses each of the plurality of state probability is a probability as set forth above in claim 1. Fodor discloses a probability when a specified maximum call blocking required is satisfied relative to said link(see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; the system/steady state probability per to Erlang Formula when meeting/satisfying GOS call blocking requirement to the link/line/connection).

Neither Soumiya, Fodor, nor Beshai explicitly disclose “a specified number of users are using said link”.

However, Ishikawa teaches each of the plurality of state probability is a probability that a specified number of users are using said link when a specified maximum call blocking required is satisfied relative to said link (see FIG. 6, state probability is a probability of number connectable users within quality when maintaining/satisfying maximum blocking probability 1%; see col. 9, line 5-20; see col. 12, line 10-50; see col. 16, line 63 to col. 17, line 11).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide “a specified number of users are using said link”, as taught by Ishikawa in the combined system of Soumiya, Fodor and Beshai so that it would provide call admission control flexibly deal with a traffic variation and stratify a given blocking probability while guaranteeing the quality; see Ishikawa col. 2, line 45-56.

**Regarding Claim 56**, the combined system of Soumiya, Fodor and Beshai discloses each of the plurality of state probability is a probability as set forth above in claim 1. Fodor discloses a probability when a specified maximum call blocking required is satisfied relative to said link(see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; the system/steady state probability per to Erlang Formula when meeting/satisfying GOS call blocking requirement to the link/line/connection).

Neither Soumiya, Fodor, nor Beshai explicitly disclose “a specified number of users are using said link”.

However, Ishikawa teaches each of the plurality of state probability is a probability that a specified number of users are using said link when a specified maximum call blocking required

is satisfied relative to said link (see FIG. 6, state probability is a probability of number connectable users within quality when maintaining/satisfying maximum blocking probability 1%; see col. 9, line 5-20; see col. 12, line 10-50; see col. 16, line 63 to col. 17, line 11).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide "a specified number of users are using said link", as taught by Ishikawa in the combined system of Soumiya, Fodor and Beshai so that it would provide call admission control flexibly deal with a traffic variation and stratify a given blocking probability while guaranteeing the quality; see Ishikawa col. 2, line 45-56.

### *Allowable Subject Matter*

14. **Claims 13, 45 and 58** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph and objection set forth in paragraph 1, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

### *Response to Arguments*

15. Applicant's arguments with respect to claims 1-6, 11-12, 20-25, 30-31, 33-38, 43, 44, 46-51, 56, 57 have been considered but are moot in view of the new ground(s) of rejection.

**Regarding claims 1-6, 11-12, 20-25, 30-31, 33-38, 43, 44, 46-51, 56, 57, the applicant argued that**, "...several recited features in claim 1 are not disclosed in the reference cited in the office action. Claim 1 at least features determining, for each of one or more candidate link sizes, both a plurality of state probabilities based on the GoS factor and a plurality of marginal packet loss probabilities...nor usage of that bandwidth is equivalent to a link size of a link to be

determined by the method of claim 1...Soumiya further fails to disclose selecting the link size of the link using a plurality of state probabilities and a plurality of marginal packet loss probabilities...There is no disclosure in Fodor that a link size of a link is determined based on GoS factor...Beshai does not disclose determining a plurality of state probabilities based on the GOS factor and a plurality of marginal packet loss probabilities based on the QoS factor..." in page 11-18.

**In response to applicant's argument, the examiner respectfully disagrees** with the argument above since the combined system of Soumiya, Fodor and Beshai discloses the claimed invention as set forth below.

Soumiya discloses determining (see FIG. 1, determining/calculating by required bandwidth calculator 13), for each of one or more candidate link sizes of said link, based on the QoS factor (see col. 10, line 10-60; see col. 9, line 25-40; calculating potential/candidate link/line bandwidth/size according to QoS; note that capacity/bandwith of a link is called the "size" of the communication link per applicant specification, paragraph 4), wherein said determining is performed based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12); determining (see FIG. 1, determining/calculating by required bandwidth calculator 13), based on user behavior (see FIG. 1, according to difference of average cell rate Ra and peak cell rate Rp which is declared by the user (i.e. user behavior/activities/act relative to the line/connection) from the cell rate comparator 11) and traffic characteristics (see FIG. 1, and traffic class from traffic class judging portion 12),

a link size of said link (see FIG. 1, calculated/determined line/link size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60) and wherein the determining said link size of said link comprises selecting one of the one or more candidate link sizes of said link (see FIG. 1, selecting/determining links/lines size/bandwidth; see col. 9, line 6-26; see col. 10, line 10-60).

Utilizing a grade of service (GoS) factor, wherein the GoS factor specifies a maximum call blocking probability for said link and a plurality of state probabilities based on the GoS factor, and using the plurality of state probabilities is so well known and established in the art as indicated by well-known Erlang Formula and well-known Fluid-Flow analysis (as admitted by the applicant in page 12 of specification), and also evidence by Fodor.

Fodor teaches receiving a grade of service (GoS) factor (see col. 3, line 10-15; see col. 10, line 1-7; receiving/obtaining grade of service (GOS) factor/ parameter), wherein the GoS factor specifies a maximum call blocking probability for said link (see col. 3, line 25-33; see col. 10, line 8-38; GOS predetermines/specifies call blocking probability, $B^{max}$, for the link/line) and determining, for each of one or more candidate link sizes of said link (see col. 3, line 10-15,34-45,60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; selecting/determining potential/candidate link/line bandwidth/size), a plurality of state probabilities based on the GoS factor (see col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67; system/steady state probability according to Erlang Formula while meeting/satisfying GOS call blocking requirement); determining comprises selection one of the one or more candidate link sizes of said link, using the probability of state probabilities (see col. 3, line 10-15, 34-45, 60 to col. 4, line 2; col. 10, line 1-6, 33 to col. 11, line 9; see col. 13, line 5 to col. 15, line 67;

selecting/determining potential/candidate link/line bandwidth/size according to system/steady state probability).

Utilizing QoS factor specifies a maximum packet loss probability for said link, and the plurality of marginal packet loss probabilities based on QoS factor, the determining comprises selecting one of the one or more using the plurality of marginal packet loss probabilities so well known in art as evident by Beshai.

Beshai discloses QoS factor specifies a maximum packet loss probability for said link (see section II, section III B-C, IV, V, Appendix. II, QoS specifics/identifies the overall/aggregate/maximum cell loss probability), and the plurality of marginal packet loss probabilities based on QoS factor (see section II; section III B-C, IV, V, Appendix. II, marginal/original probability of packet lost is determined based on QoS), and the determining comprises selecting one of the one or more candidate link sizes of said link using the plurality of state probabilities (see section III C, V, Appendix I, II, determining/selecting capacity/load/size of the link/line/connection using state probabilities according to Erlang Formula) and the plurality of marginal packet loss probabilities (see section II, section III B-C, IV, V, Appendix. II; see section II; section III B-C, IV, V, Appendix. II, and marginal/original probability of packet lost).

**In response to applicant's argument**, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871

(CCPA 1981). In this case, the rejection is based on the combined system of Soumiya, Fodor and Beshai.

**In response to applicant's arguments** against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case, the rejection is based on the combined system of Soumiya, Fodor and Beshai.

**In response to applicant's argument on** "usage of that bandwidth" is not "equivalent to a link size of a link", the applicant own "background of the invention" in paragraph 4, recites the well known facts as set forth below.

> a communication link, such as a cable, has a capacity. The capacity of a communication link describes the rate at which the communication link can transmit data. The rate at which data can be transmitted is often called "bandwidth". For example, a communication link's bandwidth may be expressed as a number of bits per second...**The capacity of a communication link may be called the "size" of the communication link**

Thus, since applicant's own specification equates that capacity/bandwith of a link to the size of the link as set forth above, examiner's assertion of Soumiya's bandwith/capacity of a link/line (which is also referred to as bit data rate) to applicant's link size of a link is proper.

### *Conclusion*

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to IAN N. MOORE whose telephone number is (571)272-3085. The examiner can normally be reached on 9:00 AM- 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 571-272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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